

14. On the Genera *Ceratocephale* Malmgren and *Tylorhynchus* Grube. By L. N. G. RAMSAY, M.A., B.Sc., Carnegie Research Scholar, Christ's College, Cambridge*.

[Received December 12, 1913: Read March 17, 1914.]

INDEX.	Page
Geographical distribution of <i>Tylorhynchus</i>	233
Systematic:	
<i>Ceratocephale osawai</i> Izuka= <i>Tylorhynchus chinensis</i> Grube ...	231
Genera <i>Ceratocephale</i> and <i>Tylorhynchus</i> , characters and relations	233

Along with the Nereidæ which he collected at Puget Sound in 1911, Mr. F. A. Potts recently handed over to me some specimens of *Ceratocephale osawai* from the Sumida River, Tokyo, Japan. The general facies of these worms recalled irresistibly to my mind Grube's figures of *Tylorhynchus chinensis*, in his paper on the Annelids of the 'Novara' Expedition (1867). Reference to the literature shows conclusively that the two species are identical.

The object of this note, then, is to draw attention to this fact, and to indicate the characters and relationship of the two genera more clearly than these have hitherto been recognized.

The identity of Tylorhynchus chinensis with Ceratocephale osawai.—Izuka, discussing the systematic position of *C. osawai* in his original description of the species, remarks that he refers it to the genus *Ceratocephale* tentatively, in preference to creating a new genus for it (1903, p. 3). If we are to regard *Tylorhynchus* as a distinct genus (and there appears to be sufficient ground for this) Izuka's hesitation was fully justified. It is probable that only lack of access to Grube's paper prevented him from recognizing the true position of the species.

The facts are as follows:—The Japanese specimens (Izuka's full description is illustrated by numerous excellent figures) agree in every way with those described by Grube† from Shanghai—as to parapodia, setæ, general form, prostomium and its appendages; but they differ in the fact that the basal ring of the proboscis is devoid of papillæ, while those on the dorsal surface of the maxillary ring are less numerous.

Among the specimens at present before me, however, three which have the proboscis everted exhibit a number of large swollen papillæ or protuberances on the basal ring, corresponding approximately to those figured by Grube, while the condition of

* Communicated by Dr. A. E. SHIPLEY, F.R.S., F.Z.S.

† Grube's description is fully detailed, and is accompanied by figures by A. Afsmann, which are far above the usual standard of the figures accompanying this authority's papers.

the maxillary ring is intermediate between those described by Grube and Izuka. Moreover, the smallest of these three specimens (which are all in the heteronereid state) has these papillæ distinctly less swollen and conspicuous than the two larger ones. It is to be noted that Izuka's specimens were from the same locality as these (the Sumida River).

Further, Izuka himself (1903, p. 9) states that the papillæ on the neural surface of the maxillary ring seem to increase in number with the age of the individual, and that in larger specimens their number varies from 17 to 27.

Further still, Izuka describes the proboscis of the worm in the nereid-form only, while Grube's specimens as they are figured were in the heteronereid condition. It is conceivable that as the worms assume the heteronereid form, the changes in the posterior region of the body may be accompanied by some swelling of the areas between the deep furrows which exist in the basal ring in the immature form. Unfortunately, none of the immature specimens at present before me has the proboscis everted, and the method of examination by slitting open this organ does not give very satisfactory results, owing to the difficulty of recognizing the soft papillæ in the compressed condition resulting from the inverting of the proboscis.

It appears, therefore, that there is no ground for even the specific separation of *chinensis* and *osawai*, and the latter name must therefore stand as a synonym of *Tylorhynchus chinensis* Grube.

The relationship of the Genera Ceratocephale and Tylorhynchus.—These genera were described independently by Malmgren and Grube in the year 1867. Since that year, various authorities have mentioned them in their schemes of classification of the Nereidæ, but their characters, especially those of *Tylorhynchus*, do not appear to have been properly comprehended. Matters were further confused when a species of the latter was referred to the former genus by Izuka in 1903, as explained above.

We must first consider whether the two genera should be regarded as distinct. On this head I think it will be agreed that the divergences are sufficient to warrant generic separation, although the two, one of which is, so far as known, confined to the Atlantic, the other to the Pacific Ocean, are certainly much more closely allied to one another than to any other genus. The chief points of difference appear to be as follows * :—

In *Tylorhynchus*,

- (a) The parapodium lacks the neuro-ligule
- (b) The neuro-cirrus is normal.
- (c) Eyes are present.

* I have not had an opportunity of examining specimens of *Ceratocephale*, which has, however, been figured and described by Malmgren (1867), McIntosh (1902), and Heinen (1911).

In *Ceratocephale*, these characters are negatived, the neuro-ligule being well-developed, the neuro-cirrus double, and eyes completely absent.

In other respects, the two show marked agreement.

The two genera appear to form a small group, diverging from the remainder of the family in the form of the parapodia, while showing some resemblance to the genera *Leonnates* and *Leptonereis* in the armature of the proboscis.

Hitherto most authors have stated that *Tylorhynchus* is characterized by the presence of hard callosities on the proboscis, as opposed to the soft papillæ of *Ceratocephale*. This is clearly due to a misapprehension of Grube's original description of *T. chinensis*, where he describes the proboscis-armature as consisting of "calli" (Latin) or "platten schwielchen." There is, however, no reason to suppose that these differ in nature from the uncornified papillæ of *Ceratocephale*, *Leonnates*, etc.

Survey of the two Genera as known up to date:—

Genus TYLORHYNCHUS Grube, 1867.

Characters.—Prostomium bearing palps, tentacles, and two pairs of eyes, as in *Nereis* L. Peristomium apodous, with four pairs of tentacular cirri. Proboscis armed only with soft papillæ, and with a pair of jaws of typical nereid form. Parapodia biramous, the rami not deeply divided, the notopodium consisting of the inferior ligule only, with setigerous lobe at its base, the superior ligule being absent. In the first two pairs the aciculum and setigerous lobe of the notopodium are absent. The noto-cirrus in the anterior region borne upon an enlarged rounded lobe; the neuropodium consisting of setigerous lobe alone, without the ventral ligule, and bearing two "lips," anterior and posterior; ventral cirrus simple. In the epitokous form no special foliaceous lobes are developed, but the original lobes are enlarged and flattened somewhat, in the middle region of the body. The setæ are homogomph and heterogomph spinigers and falcigers as in *Nereis*, but some are of slightly peculiar type. In the heteronereid cultrate setæ appear, as in *Nereis*.

Range.—Western coasts of Japan (Izuka), Shanghai (Grube). Java (Quatrefages, see below).

Species:—

T. CHINENSIS Grube, 1867.

Syn. *Ceratocephale osawai* Izuka, 1903 and 1912.

Nereis heterocheta Quatrefages, 1865.

"Die Japanischen Palolo," Osawa, 1901.

Range.—As for the genus.

Quatrefages (1865, p. 552) described, in his 'Histoire des

Annelés,' a nereid which he called *Nereis heterocheta*, from Java. Grube (1870, p. 312) states that this description refers to *Tylorhynchus chinensis*. Quatrefages' description is not sufficient for identification, but as Grube personally examined Quatrefages' material in the Paris Museum, there is no reason for hesitation in accepting this record as a good one. As Quatrefages' description was very inadequate, and was accompanied by no figures, I have not thought it necessary to give his name preference to that of Grube.

Genus CERATOCEPHALE Malmgren, 1867.

Characters.—As for *Tylorhynchus*, except that :—

Eyes are absent.

The neuropodium bears a well-developed ventral ligule as well as the setigerous lobe.

The neuro-cirri are double, the two cirri arising from a common base.

Range.—The North Atlantic (Scandinavia : Malmgren, Heinen, Levisen, etc.); Eastern North America (Gulf of St. Lawrence : McIntosh ; Massachusetts : Verrill).

Only one species has been satisfactorily described, viz., *C. loveni* Malmgren, 1867, from the Scandinavian waters. Those from the American side may prove to be identical with this, although Verrill (1879) named his specimens *C. websteri*, without, however, giving a satisfactory diagnosis, and without figures.

Bibliography of *Ceratocephale* and *Tylorhynchus*.

1865. QUATREFAGES.—Histoire Naturelle des Annelés. Paris, 1865.
1867. MALMGREN, A. J.—“Annulata polychæta Spetsbergiæ, Grönlandiæ, Islandiæ et Scandinaviæ hactenus cognita.” Öfvers. af K. Vet.-Akad. Förh. 1867, p. 176, tab. vi. fig. 33, etc.
1867. GRUBE, E.—Reise der Österreichischen Fregatte ‘Novara.’ Anneliden. Wien, 1867, p. 22, Taf. ii. fig. 3, etc.
1868. EHLERS, E.—Die Borstenwürmer. Leipzig, 1868, p. 577.
1870. GRUBE, E.—“Bemerkungen über Anneliden der Pariser Museums.” Arch. f. Naturges. 1870.
1879. VERRILL, A. E.—“Recent additions to Marine Investigation of the N.E. Coast of America.” Proc. U.S. Nat. Mus. ii. p. 165.
1879. TAUBER, P.—“Annulata Danica, i.” Kjöbenhavn, 1879.
1893. LEVINSSEN, G. M. R.—Annulata, etc. (“Særtryk af det Videnskabelige udbytte af Kanonbaaden Hauchs”), Togter i., 1883–86. Kjöbenhavn, 1893.
1894. BIDENKAP, O.—“Norges Annulata Polychæta.” Vidensk. Selsk. Förh. Christiania, 1894.

1901. OSAWA, K.—“Über die Japanischen Palolo.” Verh. Congr. Zool. Berlin, 1901, pp. 751-755.
1902. MCINTOSH, W. C.—“Notes from the Gatty Marine Laboratory, xxiii. 6. ‘On Canadian Nereidæ from the Gulf of St. Lawrence.’” Ann. Mag. Nat. Hist. (7) x. p. 258, pl. vi.
1903. IZUKA, A.—“Observations on the Japanese Palolo (*Ceratocephale osawai*).” Journ. Coll. Japan, xvii. (ii.), pls. i. & ii.
1911. HEINEN, A.—“Die Nephthydeen und Lycoriden der Nord- und Ostsee.” Wiss. Meeresunters. Kiel, N. F. xiii. 1911, p. 62, Taf. i. figs. 11-15.
1912. IZUKA, A.—“Errantiate Polychæta of Japan.” J. Coll. Japan, xxx. 1912, p. 179.
- .